The Regulatory Benefits of Safer Solvents

A variety of industries use solvents that can be hazardous to human health and therefore are regulated as environmental contaminants.

- Many create cancer risk
- Some are toxic to the nervous system, liver, kidneys or lungs, or can cause respiratory problems or skin conditions
- Many are volatile organic compounds (VOCs), which contribute to the formation of ground-level ozone pollution

Featured Solvents

- Trichloroethylene (TCE)
- Methyl chloroform (TCA, 111-trichloroethane)
- Dichloromethane (DCM, methylene chloride)
- Perchloroethylene (PERC)
- Carbon Tetrachloride (CTC)

Completely eliminating the use and generation of hazardous solvents is ideal, from a human health, environmental and cost perspective because it prevents pollution and reduces associated costs. Solvent-users should consider safer solvents to help protect the health of their workers and their community, and also to help reduce their costs of complying with environmental and workplace regulations, including those issued under the Clean Air Act, the Occupational Safety and Health Act and the Resource Conservation and Recovery Act.

Resources for effective alternatives

- Safer Choice
- Safer Chemical Ingredients List
- Toxic Use Reduction Institute

Fortunately, it is often possible to substitute toxic solvents with safer, effective alternatives, including aqueous-based solvents. For more information about safer alternatives, see https://www.epa.gov/saferchoice/products, https://www.epa.gov/saferchoice/safer-ingredients and http://www.turi.org.

Clean Air Act Compliance: Industrial solvent users can be subject to a variety of federal and state air emissions regulations that control emissions of VOCs in order to limit ground level ozone pollution, or that control emissions of hazardous air pollutants (HAPs). Compliance with these clean air regulations creates costs for industry, both by requiring companies to install emissions controls to capture and destroy VOC pollution and by requiring companies to obtain air emissions permits and to monitor and report compliance. By replacing VOC-based solvents that contain HAPs with water-based solvents or with VOC-based solvents that do not contain HAPs, facilities can avoid significant costs associated with air regulatory compliance. Eliminating or reducing the use of VOC-based solvents might allow facilities to operate without VOC control devices while staying in compliance with VOC emissions limits, and might reduce the time and resources associated with compliance (e.g. fewer air inspections, fewer reports) if the change allows the facility to switch to another type of permit.

Example: The Halogenated Solvent Cleaning Machine standard (40 CFR 63T) applies to each individual batch vapor, in-line vapor, in-line cold, and batch cold solvent cleaning machine that uses any solvent containing TCE, TCA, DCM, PERC, CTC or chloroform, or any combination of these halogenated HAP solvents, in a total concentration that is greater than 5 percent by weight. A facility currently subject to this standard that chose to permanently stop the use of such solvents would no longer be subject to Subpart T.

Some facilities may be able to avoid air regulatory requirements entirely by avoiding the use of chemicals that contain VOCs and HAPs. The ability of a facility to avoid regulatory requirements through product substitution will depend on which specific standards it is subject to and on whether it is able to completely or only partially eliminate the use of a regulated substance. Permanent elimination of regulated pollutants can allow a regulated source to avoid being subject to a regulation, such as a National Emissions Standard for Hazardous Air Pollutants (NESHAP). If such a source had no other air emission regulatory requirements, it would no longer be required to obtain an air permit. Even if the facility was still subject to other air emissions regulatory requirements, the change might make the facility eligible to switch to a permit with a lower burden of compliance such as a Federally Enforceable State Operating Permit (FESOP) or minor source registration permit.

A regulated facility considering product substitution should evaluate the potential beneficial impact of such substitutions on its regulatory costs, and should contact their permitting authority to determine how such a change could affect the facility specifically. Before ceasing any reporting or other compliance obligations under any regulation or permit, a facility should confer with their permitting and compliance authorities.

Resource Conservation and Recovery Act (RCRA) Compliance: Solvents can become hazardous wastes when they can no longer be used for their intended purpose and are discarded. A hazardous waste must be managed safely from its point of generation through recycling or disposal. When solvents can no longer be used, it is the responsibility of the generator (user) to determine whether it is a hazardous waste.

The reduction in the use of hazardous solvents and the use of non-hazardous solvents (i.e. certain aqueous based solvents) in the place of hazardous solvents, reduces hazardous substances in the environment and the workplace, and allows a facility to be subject to less stringent RCRA regulations. Additional advantages of reducing hazardous solvents usage include reduced risk, waste management costs, and liabilities.

Hazardous waste categories include:

- Large Quantity Generators (LQG) must comply with the full set of hazardous waste regulations because they generate more than 2,200 lbs (100 kg) of hazardous waste or more than 2.2 lbs (1 kg) of acute hazardous waste per calendar month;
- Small Quantity Generators (SQGs) have reduced hazardous waste regulations because they generate between 220 and 2,200 lbs (100 and 1,000 kg) per month of hazardous waste;
- Very Small Quantity Generators (VSQGs) generate up to 220 lbs (100kg) per month of hazardous waste and are exempt from hazardous waste management regulations, if they comply with 3 basic requirements – 1) identify all hazardous waste generated, 2) do not store more than 2200 pounds of hazardous waste on-site, at any one time prior to disposal, 3) ensure delivery of hazardous waste to an appropriate off-site treatment or disposal facility.

The guide *Solvents in the Workplace, How to Determine if they are Hazardous Waste* informs people who use and recycle or discard solvents about the RCRA hazardous waste regulations and assists them in making correct hazardous waste determinations for solvents. It also includes information about how to reduce the use of solvents or select alternative non-hazardous solvents. EPA's Hazardous Waste Generator Regulations: A User Friendly Reference Document provides additional more general guidance. Additional information regarding RCRA requirements can be found at EPA's Hazardous Waste Generators website, https://www.epa.gov/hazgen.

Most state RCRA hazardous waste regulations are based on the federal requirements. However, some states have developed regulations that are more stringent than the federal requirements or broader in scope. For state regulations, contact your state environmental regulatory agency or department or visit EPA's State Programs Webpage.

Compliance with Other Chemical Safety Requirements: There are many other current or proposed chemical safety standards that exist for toxic solvents under the Emergency Planning and Community Right-to-Know Act (EPCRA), the Occupational Safety and Health Act (OSHA) and the Toxic Substances Control Act (TSCA), among other federal and state laws. By working with suppliers to make informed substitutions to less- or non-toxic solvents, firms can reduce their reporting and risk management requirements and thereby reduce their environmental and operating costs and liabilities. At the same time, such substitutions can also reduce the environmental footprint of the firm and its products, and result in significant accolades and visibility in their sector.

Compliance with the Clean Water Act Requirements: These requirements continue to apply unless the facility eliminates their discharge completely. If discharge is not eliminated, a facility should notify their regulatory authority to determine whether changes to a facility's NPDES permit or pretreatment standards are necessary to ensure protection of water quality, prior to implementing any changes in solvent use.

EPA compiled this fact sheet as a supplement to the Pollution Prevention (P2) Fact Sheet "Safer Alternatives for Solvent Degreasing Applications", https://www.epa.gov/p2/case-studies-safer-alternatives-solvent-degreasing-applications, which provides a number of case studies that highlight the P2 approach of switching to aqueous and less toxic metal cleaners to reduce health risks and manufacturing costs.